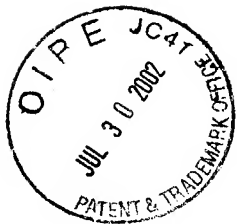


#6



7002SL.TXT
SEQUENCE LISTING

<110> GeneType A.G.
Simons, Malcolm J.

<120> INTRON SEQUENCE ANALYSIS METHOD FOR
DETECTION OF ADJACENT AND REMOTE LOCUS ALLELES AS HAPLOTYPES

<130> 21401-7002

<140> US 10/005,626

<141> 2001-12-03

<150> US 09/070,497

<151> 2000-10-16

<150> US 09/070,497

<151> 1998-04-30

<150> US 08/682,054

<151> 1996-07-16

<150> US 07/949,652

<151> 1992-09-23

<150> US 07/551,239

<151> 1990-07-11

<150> US 07/465,863

<151> 1990-01-16

<150> US 07/405,499

<151> 1989-09-11

<150> US 07/398,217

<151> 1989-08/25

<160> 78

<170> FastSEQ for windows Version 4.0

<210> 1

<211> 911

<212> DNA

<213> Homo sapien

<220>

<223> Class I-C1 allele

<400> 1

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tctacacgtc cattcccagg gcgagctcac tgtctggcag caagttcccc atggtcgagt 180
ttccctgtac aagagtccaa ggggagaggt aagtgtcctt tatittgctg gatgtagttt 240
aatattacct gaggttaaggt aaggcaaaga gtgggaggca gggagtccag ttcagggacg 300
gggattccag gagaagtga ggggaagggg ctgggcgcag cctgggggtc tctccctggt 360
ttccacagac agatccttgg ccaggactca ggcacacagt gtgacaaaga tgcttggtgt 420
aggagaagag ggatcagacg aagtcccagg tcccgggcgg gggtctcagg gtctcaggct 480
ccaaggggcg tgtctgcact ggggagggcg cggttgagg attctccact cccctgagtt 540
cacttcttct cccaacctgc gtcgggtcct tcttctgaa tactcatgac gcgtcccaa 600
ttccactcc cattgggtgt cgggttctag aagccaatca gcgtctccgc agtcccgtt 660
```

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```

ctaaagtccc cagtcaccca cccggactca gattctcccc agacgccgag atgcgggtca 720
tggcgccccg aaccctcatc ctgctgctct cgggagccct ggccctgacc gagacctggg 780
cctgtgagtg cgggggttggg agggaaacgg cctctgcgga gaggaacgag gtgcccggcc 840
ggcaggcgca ggacccgggg agccgcgcag ggaggagggt cgggcgggtc tcagcccctc 900
ctcgccccca g                                     911

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<210> 2
 <211> 587
 <212> DNA
 <213> Homo sapien

<220>
 <223> class I-C1 allele

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<400> 2
gtaccagggg cagtgggggag ctttccccat ctcccgtaga tctcccggca tggcctccca 60
cgaggagggg aggaaaatgg gatcagcgct agaatatcgc cctccctgaa atggagaatg 120
ggatgagttt tcctgagttt cctctgaggg cccctctgct tctctaggac aattaaggga 180
tgaagtcctt gaggaatgg aggggaagac agtccctgga atactgatca ggggtccctc 240
tgaccactt tgaccactgc agcagctgtg gtcaggctgc tgacctttct ctcaggcctt 300
gttctctgcc tcacgttcaa tgtgtttgaa ggtttgattc cagcttttct gagtccctcg 360
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atgaatagga gattatccca ggtgcctgtg tccaggctgg cgtctgggtt ctgtgcccc 480
ttccccaccc caggtgtcct gtccattctc aggatgggtc catgggcgct gttggagtgt 540
cgcaagagag atacaaagtg tctgaatttt ctgactcttc ccgtcag 587

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<210> 3
 <211> 913
 <212> DNA
 <213> Homo sapien

<220>
 <223> class I-C2 allele

```

<400> 3
gattaccaat attgtgctac ctactgtatc aataaaca aaaggaaactg gtgtgtatga 60
gaatctctac ctggtgcttt cagacaacac ttcaccagggt ttaaagagaa aactcctgac 120
tctacacgtc cattcccagg gcgagctcac tgtctggcat caagttcccc atggtgagtt 180
tccctgtaca agagtccaag gggagaggta agtgtccttt attttgctgg atgtagttaa 240
atattacctg aggtaaggta acggaagag tggggaggca gggagtccag ttcagggacg 300
gggattccag gagaagtga ggggaagggg ctggcgagc ctgggggtct ctccttggtt 360
tccacagaca gatccttccg gaggactcag gcacacagtg tgacaaagat gcttggtgta 420
ggagaagagg gatcaggacg aagtcccaga cccgggcggg gttctcaggg tctcaggctc 480
caaggggcgt gtctgcactg gggaggcgcc gcgttgagga ttctccactc ccctgagttt 540
cacttcttct cccaacctgc gacgggtcct tcttctgaa tactcatgac gcgtcccca 600
ttccactcc attgggtgtc gggttctaga gaagccaatc accgtctccg cagtcccggg 660
tctaaagtcc ccagtcaccc acccgactc ggattctccc cagacgccga gatgcgggtc 720
atggcgcccc gaacctcat cctgtgtctc tcgggagccc tggccctgac cgagacctgg 780
gcctgtgagt gcgggggttg gagggaaacg gcctctgcgg agaggagcga ggggcccggc 840
cggcgagggc caggacccgg gagccgcgc agggaggagg gtcgggcggg tctcagcccc 900
tcctctcccc cag                                     913

```

<210> 4
 <211> 588
 <212> DNA
 <213> Homo sapien

<220>
 <223> class I-C2 allele IVS3

```

<400> 4
gtaccagggg cagtgggggag ctttccccat ctctgtaga tctcccggga tggcctccca 60
cgaggagggg aggaaaatgg gatcagcgct agaatatcgc cctccctgaa atggagaatg 120

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```

ggatgagttt tcctgagttt cctctgaggg cccctctgct tctctaggac aattaaggga 180
tgaagtcctt gaggaatgg aggggaagac agtccctgga atactgatca ggggtcccct 240
ttgaccactt tgaccactgc agcagctgtg gtcaggctgc tgacctttct ctcaggcctt 300
gttctctgcc tcacgttcaa tgtgtttgaa ggtttgattc cagcttttct gagtccctcg 360
gcctccactc aggtcaggac cagaagtcgc tgttctctcc tcagagacta gaactttcca 420
atgaatagga gattatccca ggtgcctgtg tccaggctgg cgtctgggtt ctgtgcccc 480
ttccccaccc caggtgtcct gtccattctc aggatagtca catgggcgct gttggagtgt 540
cgcaagagag atacaaagtg tctgaatttt ctgactcttc ccgtgcag 588

```

<210> 5
<211> 366
<212> DNA
<213> Homo sapien

<220>
<223> class I-C3 allele

<221> misc_feature
<222> 75, 76
<223> n = A,T,C or G

```

<400> 5
aatctgcgtc gggctcttct tcctgaatga ctcatgacgc gtccccaatt cccactccca 60
ttgggtgtcg gaccnntcta gaaggccggg cagcgtctcc gcagtcccgg ttctgaagtc 120
cccagtcacc caccggact cagattctcc ccagacgcc agatgcgggt catggcgccc 180
cggaccctca tcctgtgtct ctcgggagcc ctggccctga ccgagacctg ggccggtgag 240
tgccgggttg ggagggaaatc ggcctcttgc ggagaggagc gaggggcccg cccggcgagg 300
ggcgaggagc ccggggagcc gcgcagggag gagggtcggg cgggtctcag cccctcctcg 366
ccccag

```

<210> 6
<211> 578
<212> DNA
<213> Homo sapien

<220>
<223> class I-C3 allele IVS3

```

<400> 6
gtaccagggg cagtgggagc cttccccatc tcctgtagat ctcccgggat ggcctccac 60
gaggagggga ggaaaatggg atcagcgcta gaatatcgcc ctccctgaaa tggagaatgg 120
gatgagtttt cctgagtttc ctctgagggc cccctctgct ctctgaggac aattaaggga 180
tgaagtcctt gaagaaatgg aggggaagac agtccctaga atactgatca ggggtcccct 240
ttgaccactg cagcagctgt ggtcaggctg ctgacctttc tctcaggcct tgttctctgc 300
ctcacgctca atgtgtttga aggtttgatt ccagcttttc tgagtccttc ggcctccact 360
caggtcagga ccagaagtcg ctgttcctcc ctcagagact agaactttcc aatgaatagg 420
agattatccc aggtgcctgt gtccaggctg gcgtctgggt tctgtgcccc cttccccacc 480
ccaggtgtcc tgtccgttct caggatgggt acatgggcgc tgttggagtg tcgcaagaga 540
gatacaaagt gtctgaattt tctgactctt cccgtcag 578

```

<210> 7
<211> 717
<212> DNA
<213> Homo sapien

<220>
<223> class I-B27 allele

```

<400> 7
gagctcactc tctggcatca agttctccgt gatcagtttc cctacacaag atccaagagg 60
agaggtaaag agtgagaggc agggagtcca gttcaggagc agggattcca ggaggagaag 120
tgaaggggaa gcgggtgggc gccactgggg gtctctccct gggttccaca gacagatcct 180
tgtgccggac tcaggcagac agtgtgacaa agaggctggg gtaggagaag agggatcagg 240

```

7002SL.TXT

```

acgaacgtcc aaggccccgg gcgcggtctc aggggtctcag gctccgagag ctttgtctgc 300
attggggagg cgcacagttg ggggtcccca ctcccacgag ttctacttct tctcccaacc 360
tatgtcgggt ccttcttcca ggatactcgt gacgcgtccc catttccact cccattgggt 420
gtcgggtgtc tagagaagcc aatcagtgtc gccgggggtcc cagtctctaa gtccccacgc 480
acccaccggg actcagaatc tcctcagacg ccgagatgcg ggtcacggcg ccccgaaacc 540
tcctcctgct gctctggggg gcagtggccc tgaccgagac ctgggctggg gagtgcgggg 600
tcaggcaggg aaatggcctc tgtggggagg agcaggggga cgcaggcggg ggcgaggagc 660
ccggggagcc gcgccgggag gagggtcggg cgggtctcag cccctcctcg cccccag 717

```

<210> 8
 <211> 575
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-B27 allele IVS3

```

<400> 8
gtaccagggg cagtggggag ccttccccat ctcttatagg tcgccgggga tggcctccca 60
cgagaagagg aggaaaatgg gatcagcgct agaatgtcgc cctcccttga atggagaatg 120
gcatgagttt tcctgagttt cctctgaggg cccctcttct tctctaggac aattaaggga 180
tgacgtctct gaggaaatgg aggggaagac agtccctaga atactgatca ggggtccccct 240
ttgacccctg cagcagcctt gggaaaccgt acttttctc tcaggccttg ttcacagcct 300
cacactcagt gtgtttgggg ctctgattcc agcacttctg agtcacttta cctccactca 360
gatcaggagc agaagtccct gttccccgct cagagactcg aactttccaa tgaataggag 420
attatccagc gtgcctgcgt ccaggctggg gtctgggttc tgtgccccct cccaccccca 480
gggtgtcctg ccattctcag gctggtcaca tgggtgggtc tagggtgtcc catgagagat 540
gcaaagcgcc tgaattttct gactcttccc atcag 575

```

<210> 9
 <211> 289
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-B58 allele

```

<400> 9
tctagagaag ccaatcagtg tcgccggggt cccagttcta aagtccccac gcacccaccc 60
ggactcagaa tctcctcaga cgccgagatg cgggtcacgg cgccccgaac cgtcctcctg 120
ctgctctggg gggcagtggt cctgaccgag acctggggcg gtgagtgcgg ggtcgggagg 180
gaaatggcct ctgtggggag gagcgagggg accgcaggcg ggggcgcagg acctgaggag 240
ccgcgccggg aggaagggtc ggcgggtctc agccccctct cgccccag 289

```

<210> 10
 <211> 575
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-B58 allele IVS3

```

<400> 10
gtaccagggg cagtggggag ccttccccat ctcttatagg tcgccgggga tggcctccca 60
cgagaagagg aggaaaatgg gatcagcgct agaatgtcgc cctcccttga atggagaatg 120
gcatgagttt tcctgagttt cctctgaggg cccctcttct tctctaggac aattaaggga 180
tgacgtctct gaggaaatgg aggggaagac agtccctaga atactgatca ggggtccccct 240
ttgacccctg cagcagcctt gggaaaccgt acttttctc tcaggccttg ttctctgcct 300
cacactcagt gtgtttgggg ctctgattcc agcacttctg agtcacttta cctccactca 360
gatcaggagc agaagtccct gttccccgct cagagactcg aactttccaa tcaataggag 420
attatccagc gtgcctgcgt ccaggctggg gtctgggttc tgtgccccct cccacacca 480
gggtgtcctg ccattctcag gctggtcaca tgggtgggtc tagggtgtcc catgagagat 540
gcaaagcgcc tgaattttct gactcttccc atcag 575

```

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<210> 11
 <211> 728
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-A2 allele

<400> 11
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 tggacaggta aggagtggga gtcagggagt ccagttccag ggacagagat tacgggataa 120
 aaagtgaag gagagggacg gggcccatgc cgaggggttc tcccttggtt ctcagacagc 180
 tcttgggcca agactcaggg agacattgag acagagcgct tggcacagaa gcagaggggt 240
 cagggcgaag tccagggccc caggcggttg ctctcagggt ctcaggcccc gaagggcggt 300
 gtatggattg gggagtccca gccttgggga ttcccaact ccgcagtttc ttttctccct 360
 ctcccaacct atgtagggtc cttcttcctg gatactcacg acgcggaccc agttctcact 420
 cccattgggt gtcgggtttc cagagaagcc aatcagtgtc gtcgcggtcg cggttctaaa 480
 gtccgcagc accacccggg actcagattc tccccagacg ccgaggatgg ccgtcatggc 540
 gccccgaacc ctcgtcctgc tactctcggg ggctctggcc ctgaccaga cctgggcggg 600
 tgagtgcggg gtcgggaggg aaacggcctc tgtggggaga agcaacgggc cgcctggcgg 660
 gggcgacagg cccgggaagc cgcgcgggga ggagggtcgg gcgggtctca gccactcctc 720
 gtccccag 728

<210> 12
 <211> 599
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-A2 allele IVS3

<400> 12
 gtaccagggg ccacggggcg cctccctgat cgctgtaga tctcccgggc tggcctccca 60
 caaggagggg agacaattgg gaccaacact agaatatcg cctccctctg gtcctgaggg 120
 agaggaaatc tcctgggttt ccagatcctg taccagagag tgactctgag gttccgccct 180
 gctctctgac acaattaagg gataaaatct ctgaaggaaat gacgggaaga cgatccctcg 240
 aatactgatg agtgggtccc tttagacacac acaggcagca gccttgggccc cgtgactttt 300
 cctctcaggc cttgttctct gcttcacact caatgtgtgt gggggtctga gtccagcact 360
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 ctagaatttc cacggaatat gagattatcc caggtgcctg tgtccagggt ggtgtctggg 480
 ttctgtgctc ccttccccat ccaggtgtc ctgtccattc tcaagatagc cacatgtgtg 540
 ctggaggagt gtcccatgac agatcgaaaa tgcctgaatg atctgactct tcctgacag 599

<210> 13
 <211> 450
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-A3 allele

<400> 13
 ccgaagggct gtgtaaggat tggggagtc cagccttggg attccccaac tccgcagttt 60
 cttttctccc ctgctcccaa cctacgtagg gtccttcac ctggatactc acggacgcgg 120
 accagattct cactcccatt ggggtgctggg ttccagaga agccaatcag tgtcgtcgct 180
 gttctaaagc ccgcacgcac ccaccgggac tcagattctc cccagacgcc gaggatgggt 240
 gtggagacca ggccgtcatg gcgccccgaa cctcctcct gctactctcg ggggccctgg 300
 ccttgaccca gacctgggag ggtgagtgcg gggtcgggag ggaaccacgc ctctgcgggg 360
 agaagcaagg ggcctcctgg cgggggcgca ggaccggggg agccgcgccg ggacgagggg 420
 cgggcgggtc tcagccactg ctccccccag 450

<210> 14

HE

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<211> 576
<212> DNA
<213> Homo sapien

<220>
<223> Class I-A3 allele IVS3

<400> 14
gtaccagggg ccacgggagc ctccctgacg gcctgtagat ctcccgggct ggcctccac 60
aaggagggga gaccattggg acccacacta ggatatcacc ctccctttgg ttctgagggg 120
gaggaattct tcttggtttc aggacctgga ccagagagtg actctgaggt ttcggcctgc 180
tcacaggcac aattaaggga taaatctctg aaggagtgac gggaagacga ttccttgat 240
tctggtgagt ggttcccttt ggcaccggcg acggccttgg gcccgtgact tttcctctca 300
ggccttggtc tctgcttcac actcaatgtg tgtgggggtc tgagtcacgc acttctgagt 360
ccctcagcct ccactcaggt caggaccaga agtcgctgtt cccttctcag ggaatagaag 420
attatcccag gtgcctgtgt ccaggctggg gtctgggttc tgtgctccct tccccatccc 480
gggtgtcctg tccattctca agatggccac atgcgtgctg gtggagtgtc ccatgacaga 540
tgcaaatgac ctgaattttc tgactcttcc cgtcag 576

<210> 15
<211> 435
<212> DNA
<213> Homo sapien

<220>
<223> Class I-Ax allele

<221> misc_feature
<222> 348
<223> n = A,T,C or G

<400> 15
ccgaaggcg gtgtatggat tggggatgcc cagccttggg gattcgccac ctccgcagtt 60
tctcttcttc tcacaacctg cgacgggtcc ttcttctctg atactcacga agcggacaca 120
gttctcattc ccactaggtg tcgggtttct agagaagcca atcggtgccg ccgcggtccc 180
ggttctaaag tccccacgca cccaccggga ctgagattct cccagacgc cgaggatgtc 240
gccgtcatgg cgccccgaac cctcctcctg ctgctctcag gggccctggc cctgaccag 300
acctgggcgc gtgagtgacg ggtctgcagg gaaatggctg ggaggagnga ggggcccgc 360
cggcgggggtg cgcaggaccc agggagccgc gcaggaggga gggtcgggcg ggtctcagct 420
cctcctcgtc ccag 435

<210> 16
<211> 569
<212> DNA
<213> Homo sapien

<220>
<223> Class I-Ax allele IVS3

<400> 16
gtaccagggc cacagggcgc ctccctgacg gcctgtagat ctcccgggct ggcctccac 60
aagaaaggga gacaaatggg accaacacta taatatcgcc ctccctctgg tcttgagggg 120
gaggaatcct cttgggtttc cagagagtga ctctgagggg ccgctgctc tctgacacaa 180
ttaagggatg aaatctgtga ggaaatgaag ggaagacaat ccctggaata ctgatgagt 240
gttccctttg acactggcag cagccttggg ccccgtagact tttcctctca ggccttggtc 300
tctgcttcac actcaatgtg cgtgggggtc tgagtcctca gcctccactc aggtcaggac 360
cagaagtgcg tgttccctct tcagggacta gaattttcca cggaatagga gattattcta 420
gggtgcctctg tctaggctgg tttctgggtt ctgtgctccc tccccaccc taggcattct 480
gtcaattctc aagatggcca catgcgtgct ggtggagtgt cccatgacag atgcaaaatg 540
cctgaatttt ctgactcttt tcccgtcag 569

<210> 17
<211> 442

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<212> DNA
 <213> Homo sapien

<220>
 <223> Class I-A24 allele

<400> 17
 ggccccgaag cgggtgtatgg attgggggagt cccagccttg ggattcccaa ttccgcagtt 60
 tcttttctcc ctgtcccaac ctatgtaggg tctttctcct ggatactcac gacgcggacc 120
 cagttctcac tcccattggg tgteggggtt cgagagaagc caatcaatgt cgtcgcgggtc 180
 gctgttctaa agtccgcacg caccacccgg gactcagatt ctccccagac gccgaggatg 240
 gccgtcatgg ggccccgaac cctcgtcctg ctactctcgg gggccctggc cctgacccag 300
 acctggggcag gtgagtgcgg ggtegggagg gaaatcggcc ctctgcgggg agaagcaagg 360
 ggcccgcctg gcgggggagc aagacccggg aagccgcgcc gggaggaggg tcgggcgggt 420
 ctcagccact cctcgtcccc ag 442

<210> 18
 <211> 558
 <212> DNA
 <213> Homo sapien

<220>
 <223> Class I-A24 allele IVS3

<400> 18
 gtaccagggg ccacggggcg cctccctgat cgcctgtagg tctcccgggc tggcctcccc 60
 acaaggaggg gagacaattg ggaccaacac tagaatatcg ccctccctct ggtcttgagg 120
 gagaggaatc ctcttggtt tccagatcct gtaccagaga gtgactctga ggttccgccc 180
 tgctctctga cacaattaaag ggataaaatc tctgacggaa tgacggaaaag acgatccctc 240
 gaatactgat gactggttcc ctttgacacc ggcagcagcc ttgggaccgt gacttttctc 300
 ctcaggccctt gttctctgct tcacactcaa tgtgtgtggg ggtctgagtc cagcacttct 360
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 gaagattatc ccagggcctg tgtccaagct ggtgtctggg ttctgtactc tcttccccgt 480
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 aggtgcaaaa cccgtcag 558

<210> 19
 <211> 806
 <212> DNA
 <213> Homo sapien

<220>
 <223> DQA1-A3

<400> 19
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 tttgttatta actgatgaaa gaattaagtg aaagataaac cttaggaagc agaggggaagt 120
 taatctatga ctaagaaagt taagtactct gataactcat tcattccttc ttttgttcat 180
 ttacattatt taatcacaag tctatgatgt gccaggctct caggaaatag tgaaaattgg 240
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 cggacaacta tcaacacgaa gcggggagga agcaggggct ggaaatgtcc acagactttg 360
 ccaaagacaa agcccataat atctgaaagt cagtttcttc catcattttg tgtattaagg 420
 ttctttattc ccctgttctc tgccttctct cttgtcatct tcactcatca gctgaccatg 480
 ttgcctctta cgggtgtaaac ttgtaccagt cttatgggtc ctctgggcag tacagccatg 540
 aatttgatgg agacgaggag ttctatgtgg acctggagag gaaggagact gtctggcagt 600
 tgccctctgtt ccgcagattt agaagatttg acccgcaatt tgcactgaca aacatcgctg 660
 tgcataaaca taacttgaac atcgtgatta aacgctccaa ctctaccgct gctaccaatg 720
 gtatgtgtcc accattctgc ctttctttac tgatttatcc ctttatacca agtttcatta 780
 ttttctttcc aagagggtccc cagatc 806

<210> 20
 <211> 819
 <212> DNA

7002SL.TXT

<213> Homo sapien

<220>

<221> misc_feature

<222> (0)...(0)

<223> DQA1-A1.2

<400> 20

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taaacctaat ttctgactaa gaaagctaaa tactatgata actcattcat tccttctttt 180
gttcaattac attatttaat cataagtcca tgacgtgccca ggcactcagg aaatagtaaa 240
aattggacat gcgatattct gcccttgtgt agcgcacact agagtgggaa agaaagtgca 300
cttttaactg gacaactacc aacatgaaga ggggaggaag caggggctgg aaatgtccac 360
agactgtgcc aaaaaatgaa gcccataata tttgaaagtc aggtctttcc atcattttgt 420
gtattaagggt tctttcttcc tctgttctcc gcccttctgc ttgtcatctt cactcatcag 480
ctgaccacgt tgcctcttgt ggtgtaaact tgtaccagtt ttacgggtccc tctggccagt 540
acacccatga aittgatgga gatgagcagt tctacgtgga cctggagagg aaggagactg 600
cctggcggtg gcctgagttc agcaaatttg gaggttttga cccgcagggg gcactgagaa 660
acatggctgt ggcaaaacac aacttgaaca tcatgattaa acgctacaac tctaccgtg 720
ctaccaatgg tatgcgtcca ccattctgcc tctctttact taataagcta tccctccata 780
ccaaggttca ttattttctt cccaagaggt ccccgatc 819

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<210> 21

<211> 815

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (0)...(0)

<223> DQA1-A4.1

<400> 21

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gacctctgtg tagagtgtcc tggtctgagc cagtcctgag aggaaagaaa atacaatcag 60
tttggttatta actgatgaaa gaattaagtg aaagatgaat cttaggaagc agaaggaagt 120
aaacctaatc tctgactaag aaagctaaat accataataa ctcatcatt ccttcttttg 180
ttcaattaca ttgatttaat cataagtccg tgatgtgccca ggcactcagg aaatagtaaa 240
aactggacat gtgatattct gcccttgtgt agcgcacatt atagtgggaa agaaagcgca 300
attttaaccg gacaactacc aacaataaga gtggaggaag caggggttgg aaatgtccac 360
aggctgtgcc aaagatgaag cccgtaatat ttgaaagtca gttcttttca tcatcatttt 420
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agctgaccac gtcgcctctt atggtgtaaa cttgtaccag tcttacggtc cctctggcca 540
gtacacccat gaatttgatg gagatgagca gttctacgtg gacctgggga ggaaggagac 600
tgtctgggtg ttgcctgttc tcagacaatt tagaatttga cccgcaattt gcactgacaa 660
acatcgctgt cctaaaacat aacttgaaca gtctgattaa acgctccaac tctaccgtg 720
ctaccaatgg tatgtgtcaa caattctgcc cctctttact gatttatccc ttcataccaa 780
gtttcattat tttattttcca agaggtcccc agatc 815

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<210> 22

<211> 1292

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (0)...(0)

<223> DQB1

<400> 22

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aagcttgtgc tctttccatg aataaatgtc tctatctagg actcagaggt gtaggtcctt 60
tccaacatag aagggaactg acctcaacgg gacttgggag ggtaaactta ggcatgggaa 120
ggaaggtatt ttacccaggg accaagagaa tacgcgtgtc agaacgaggc caggcttaat 180

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7002SL.TXT

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tcctggacct atctcgatcat tccgttgaac tctcagattt atgtggataa ctttatctct 240
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agtgcagagg tgcattgtaaa atcagcccga ctgcctcttc gctgggttca caggctcagg 360
cagggacagg gctttcctcc ctttcctgga tgtaggaagg cagattccag aagcccga 420
agaaggcggg cagagctggg cagagccgcc gggaggatcc caggctctgga gcgccaggca 480
cgggcggggc ggaactggag gtcgcgcggg cgggtccaca gctccaggcc gggtcagggc 540
ggcggctgcg ggggcggccg ggctggggcc tgactgaccg gccggtgatt ccccgagag 600
gatttcgtgt accagtttaa gggcatgtgc tacttcacca acgggacgga gcgctgctgc 660
cttgaacca gacacatcta taaccgagag gactacgcg gcttcgacag cgactgggg 720
gtgtaccggg cgggtgacgc ccaggggcgg cctgttgccg agtactggaa cagccagaag 780
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<210> 23
<211> 1291
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (0)...(0)
<223> DQB1

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<400> 23
aagcttgtgc tctttccatg aataaatgtc tctatctagg actcagaggt gtaggtcctt 60
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ggaaggtatt ttaccagagg accaagagaa tacgctgtgc agaacgaggc caggcttaat 180
tcctggacct atctcgatcat tccgttgaac tctcagattt atgtggataa ctttatctct 240
gaggtatcca ggagcttcat gaaaaatggg atttcatgcg agaacgccct gatccctcta 300
agtgcagagg tgcattgtaaa atcagcccga ctgcctcttc gctgggttca caggctcagg 360
cagggacagg gctttcctcc ctttcctgga tgtaggaagg cagattccag aagcccga 420
agaaggcggg cagagctggg cagagccgcc gggaggatcc caggctctgga gcgccaggca 480
cgggcggggc ggaactggag gtcgcgcggg cgggtccaca gctccaggcc gggtcagggc 540
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gatttcgtgt accagtttaa gggcatgtgc tacttcacca acgggacgga gcgctgctgc 660
cttgaacca gacacatcta taaccgagag gactacgcg gcttcgacag cgactgggg 720
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gaagtccctg agaggacccg ggcggagttg gacacggtgt gcagacacaa ctacgaggtg 840
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ttggccggga ccccgagtct ctgtgccggg agggcgatgg gggcgaggtc tctgaaatct 960
gagcccagtt cattccaccc cagggaagg agggcgggc ggggggtggt ggggcaggtg 1020
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tagtgtcccc cccagcctcc ccgtccgtcg gcctcgtcct ctgctctgga cgtttctcgc 1140
ctcgtgcctt atgcgtttgc ctctcgtgc cttaccttcg ctaagcagtt ctctctgccc 1200
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cccacagttg ccgattcgcc gcaggaagct t

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<210> 24
<211> 1289
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (0)...(0)
<223> DQB1

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<221> misc_feature
 <222> 448, 450, 453
 <223> n = A,T,C or G

<400> 24
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 atgggaagga aggtatttta cccagggacc aagagaatag gcgtatcgga agaggacagg 180
 ttttaattcct ggacctgtct cgtcattccc ttgaactgtc aggtttatgt ggataacttt 240
 atctctgagg taccaggagc tccatggaaa atgagatttc atgcgagaac gccctgatcc 300
 ctctaagtgc agagggtccat gtaaaatcag cccgactgcc tcttcacttg gttcacaggc 360
 cgagacaggg acagggcttt cctccctttc ctgcctgtag gaaggccgga tccccgaaga 420
 cccccgagag ggcgggcagg gctggcanan cncccgggag gatcccagg ctgcagcgcg 480
 aggcacgggg gggcgggaac ttgtggctgc gcgggctggt ccacagctcc gggccggggtc 540
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 agaggatttc gtgtaccagt ttaagggcat gtgtacttcc accaacggga cagagcgcg 660
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 gggggaggtc cgggcgggtg cgtgctggg gctgcctgcc gccgagtact ggaacagcca 780
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 agtttcgccc catcctcccc gtccgtcggc ctgcctctc gctctgcacg tcttgcctc 1140
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 acctacacag ctcatgcagt ggaagcctt 1289

<210> 25
 <211> 1307
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> DQB1

<400> 25
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 aaggagagga ttttaccag ggaccaagag aatacgcgat tcagaacgag gacaggctta 180
 atttctggac ccgtctcatc attcccttga actcacagg tttatgtgat aattttatct 240
 ctgagggttc caggagctca atggaaaatg ggatttcatg cgagagcgcc ctgattccct 300
 ctaagtgcag aggtctatgt aaaatcagcc cgaactgcctc ttccctcggg tcacaggctc 360
 cggcagggac agggctttcc gccctttcct gcctgcagga aggcggattc ccgaagcccc 420
 cagagagggc gggcagggct gggcagagcc gccgggaggga tcacaagtct ggagcgccag 480
 gcacgggcgg gcgggaactg gaggtcgcgc gggcgggttc acagctccgg gccgggtcag 540
 ggcgggcggc gcgggggcgg ccgggctggg gccgggcccgg ggcctgactg accggccggg 600
 gattccccgc agaggatttc gtgtaccagt ttaaggcat gtgtacttc accaacggga 660
 cggagcgcg gcgtcttgtg accagataca tctataaccg agaggagtac gcacgcttcg 720
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 tccgtgagc ccatccttgg caggggcccc gactctctgc cgcgggaggg gcgaaggggg 960
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 gcagtttctc ctgccccag tgccccacct ctcccctgc ccgcccggcct cgctagcact 1260
 gccccaccca gcaaggccca cagtcgcgca ttcgccgcag gaagcctt 1307

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<210> 26
 <211> 418
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> DPB 4.1

<400> 26
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 gagtggcgcc tccgctcatg tccgccccct ccccgagag aattaccttt tccagggacg 120
 gcaggaatgc tacgcgttta atgggacaca gcgcttcctg gagagataca tctacaaccg 180
 ggaggagttc gcgcgcttcg acagcgacgt gggggagttc cgggcggtga cggagctggg 240
 gcggcctgct gcggagtact ggaacagcca gaaggacatc ctggaggaga agcgggcagt 300
 gccggacagg atgtgcagac acaactacga gctgggcggg cccatgaccc tgcagcgccg 360
 aggtgagtga gggctttggg ccggcggtcc cagggcagcc ccgcgggccc gtgcccag 418

<210> 27
 <211> 300
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> DPB9

<400> 27
 ggatccgcag agaattacgt gcaccagtta cggcaggaat gctacgcgtt taatgggaca 60
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 gtgggggagt tccgggcggt gacggagctg gggcggcctg atgaggacta ctggaacagc 180
 cagaaggaca tcctggagga ggagcgggca gtgccggaca gggatatgcag acacaactac 240
 gagctggacg aggccgtgac cctgcagcgc cgaggtgagt gagggctttg ggccggcggt 300

<210> 28
 <211> 300
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> DPB New

<400> 28
 ggatccgcag agaattacgt gcaccagtta cggcaggaat gctacgcgtt taatgggaca 60
 cagcgcttcc tggagagata catctacaac cgggaggagt tcgtgcgctt cgacagcgac 120
 gtgggggagt tccgggcggt gacggagctg gggcggcctg atgaggacta ctggaacagc 180
 cagaaggacc tcctggagga gaagcgggca gtgccggaca gggatatgcag acacaactac 240
 gagctggacg aggccgtgac cctgcagcgc cgaggtgagt gagggctttg ggccggcggt 300

<210> 29
 <211> 300
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (0)...(0)

7002SL.TXT

<223> DPW3

<400> 29

ctccccgcag agaattacct tttccagggg cggcaggaat gctacgcgtt taatgggaca 60
cagcgccttc tggagagata catctacaac cgggaggagt tcgcgcgctt cgacagcgac 120
gtgggggagat tccgggaggat gacggagctg gggcgccctg ctgcggagta ctggaacagc 180
cagaaggacc tcctggagga gaagcgggca gtgccggaca gggatatgag acacaactac 240
gagctggagc aggccgtgac cctgcagcgc cgaggtgagt gagggctttg ggccggcggg 300

<210> 30

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> A location specific primer; allelic location: nt
1735-1757 of A3; designation: SGD009.AIVS3.R2NP

<400> 30

catgtggcca tcttgagaat gga 23

<210> 31

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> A locus specific primer; allelic location: nt
1541-1564 of A2; designation: SGD006.AIVS3.R1NP

<400> 31

gcccgggaga tctacaggcg atca 24

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> A location specific primer; allelic location: nt
1533-1553 of A2; designation: A2.1

<400> 32

cgctccctg atcgctgta g 21

<210> 33

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> A locus specific primer; allelic location: nt
1667-1685 of A2; designation: A2.2

<400> 33

ccagagagt actctgagg 19

<210> 34

7002SL.TXT

<211> 14
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> A location specific primers; allelic location: nt
 1704-1717 of A2; designation: A2.3

<400> 34
 cacaattaag ggat 14

<210> 35
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> B location specific primers; allelic location: nt
 1108-1131 of B17; designation: SGD007.BIVS3.R1NP

<400> 35
 tccccggcga cctataggag atgg 24

<210> 36
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> B location specific primer; allelic location: nt
 1582-1604 of B17; designation:SGD010.BIVS3.R2NP

<400> 36
 ctaggaccac ccatgtgacc agc 23

<210> 37
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> B location specific primer; allelic location: nt
 500-528 of B27; designation: B2.1

<400> 37
 atctcctcag acgccgagat gcgtcac 27

<210> 38
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> B location specific primer; allelic location: nt
 545-566 of B27; designation: B2.2

<400> 38
ctcctgctgc tctggggggc ag 22

<210> 39
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> B location specific primer; allelic location: nt
1852-1876 of B27; designation: B2.3

<400> 39
actttacctc cactcagatc aggag 25

<210> 40
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> B location specific primer; allelic location: nt
1945-1976 of B27; designation: B2.4

<400> 40
cgtccaggct ggtgtctggg ttctgtgccc ct 32

<210> 41
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> B location specific primer; allelic location: nt
2009-2031 of B27; designation: B2.5

<400> 41
ctggtcacat ggggtggcct agg 23

<210> 42
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> B location specific primer; allelic location: nt
2054-2079 of B27; designation: B2.6

<400> 42
cgcctgaatt ttctgactct tcccat 26

<210> 43
<211> 24

7002SL.TXT

<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
1182-1204 of C3; designation: SGD008.CIVS3.R1NP

<400> 43
atccccgggag atctacagga gatg 24

<210> 44
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
1665-1687 of C3; designation: SGD011.CIVS3.R2NP

<400> 44
aacagcgccc atgtgaccat cct 23

<210> 45
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
499-525 of C; designation: C2.1

<400> 45
ctggggagggc gccgcgttga ggattct 27

<210> 46
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
642-674 of C1; designation: C2.2

<400> 46
cgtctccgca gtcccgggttc taaagttccc agt 33

<210> 47
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
738-755 of C1; designation: C2.3

7002SL.TXT

<400> 47
atcctcgtgc tctcggga 18

<210> 48
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
1970-1987 of C1; designation: C2.4

<400> 48
tgtggtcagg ctgctgac 18

<210> 49
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
2032-2051 of C1; designation: C2.5

<400> 49
aaggtttgat tccagctt 18

<210> 50
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
2180-2217 of C1; designation: C2.6

<400> 50
ccccttcccc accccagggtg ttctgtcca ttcttcagga 40

<210> 51
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> C location specific primer; allelic location: nt
2222-2245 of C1; designation: C2.7

<400> 51
cacatgggacg ctgttgaggt gtcg 24

<210> 52
<211> 22
<212> DNA
<213> Artificial Sequence

7002SL.TXT

<220>
 <223> Class I loci-specific primers; allelic location:
 nt 599-620 of A2; designation: SGD005.IIVS1.LNP

<400> 52
 gtgagtgcgg ggtcgggagg ga 22

<210> 53
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Class I loci-specific primers; allelic location:
 nt 489-506 of A2; designation: 1.1

<400> 53
 cacccaccgg gactcaga 18

<210> 54
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Class I loci-specific primers; allelic location:
 nt 574-595 of A2; designation: 1.2

<400> 54
 tggccctgac ccagacctgg gc 22

<210> 55
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Class I loci-specific primers; allelic location:
 nt 691-711 of A2; designation: 1.3

<400> 55
 gagggtcggg cgggtctcag c 21

<210> 56
 <211> 16
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Class I loci-specific primers; allelic location:
 nt 1816-1831 of A2; designation: 1.4

7002SL.TXT

<400> 56
ctctcaggcc ttgttc 16

<210> 57
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Class I loci-specific primers; allelic location:
nt 1980-1923 of A2; designation: 1.5

<400> 57
cagaagtcgc tgttcc 16

<210> 58
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> DQA1 locus-specific primer; allelic location: nt
23-41 of DQA3; designation: SGD001.DQA1.LNP

<400> 58
ttctgagcca gtcctgaga 19

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> DQA1 locus-specific primer; allelic location: nt
45-64 of DQA3; designation: DQA3 E1a

<400> 59
ttgccctgac caccgtgatg 20

<210> 60
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> DQA1 locus-specific primer; allelic location: nt
444-463 of DQA3; designation: DQA3 E1b

<400> 60
cttcttgctt gtcatttca 20

<210> 61
<211> 18
<212> DNA
<213> Artificial Sequence

7002SL.TXT

<220>
 <223> DQA1 locus-specific primer; allelic location: nt
 536-553 of DQA3; designation: DQA3 E1c

<400> 61
 ccatgaattt gatggaga 18

<210> 62
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQA1 locus-specific primer; allelic location: nt
 705-723 of DQA3; designation: DQA3 E1d

<400> 62
 accgctgcta ccaatggta 19

<210> 63
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQA1 locus-specific primer; allelic location: nt
 789-806 of DQA3; designation: SGD003.DQA1.RNP

<400> 63
 ccaagagggtc cccagatc 18

<210> 64
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DRA locus-specific primer; allelic location: nt
 49-68 of DRA HUMMHDRAM (1183 nt sequence,
 Accession No. K01171); designation: DRA E1

<400> 64
 tcacatagc tctgctgatg 20

<210> 65
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DRA locus-specific primer; allelic location: nt
 98-118 of DRA HUMMHDRAM (1183 nt sequence,
 Accession No. K01171); designation: DRA 5'E2 (5'
 indicates the primer is used as the 5' primer)

7002SL.TXT

<400> 65
agaacatgtg atcatccagg c 21

<210> 66
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> DRA locus-specific primer; allelic location: nt
319-341 of DRA HUMMHDRA (1183 nt sequence,
Accession No. K01171); designation: DRA 3'E2

<400> 66
ccaactatac tccgatcacc aat 23

<210> 67
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> DRB locus-specific primer; allelic location: nt
79-101 of DRB HUMMHDRC (1153 nt sequence,
Accession No. K01171); designation: DRB E1

<400> 67
tgacagtgc actgatgggtg ctg 23

<210> 68
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> DRB locus-specific primer; allelic location: nt
123-143 of DRB HUMMHDRC (1153 nt sequence,
Accession No. K01171); designation: DRB 5'E2

<400> 68
ggggacaccc gaccacgttt c 21

<210> 69
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> DRB locus-specific primer; allelic location: nt
357-378 of DRB HUMMHDRC (1153 nt sequence,
Accession No. K01171); designation: DRB 3'E2

<400> 69
tgacagacaca actacgggggt tg 22

<210> 70

7002SL.TXT

<211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQB1 locus-specific primer; allelic location: nt
 509-532 DQB1 DQW1Va; designation: DQB E1

<400> 70
 tggctgaggg cagagactct ccc 23

<210> 71
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQB1 locus-specific primer; allelic location: nt
 628-647 of DQB1 DQW1Va; designation: DQB 5'E2

<400> 71
 tgctacttca ccaacgggac 20

<210> 72
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQB1 locus-specific primer; allelic location: nt
 816-834 of DQB1 DQW1Va; designation: DQB 3'E2

<400> 72
 ggtgtgcaca cacaactac 19

<210> 73
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQB1 locus-specific primer; allelic location: nt
 124-152 of DQB1 DQW1Va ; designation: DQB 5'IVS1a

<400> 73
 aggtatttta cccagggacc aagagat 27

<210> 74
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DQB1 locus-specific primer; allelic location: nt
 314-340 of DQB1 DQW1Va; designation: DQB 5'IVS1b

7002SL.TXT

<400> 74
atgtaaaatc agcccgactg cctcttc 27

<210> 75
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> DQB1 locus-specific primer; allelic location: nt
1140-1166 of DQB1 DQW1Va ; designation: DQB 3'IVS2

<400> 75
gcctcgtgcc ttatgcgttt gcctcct 27

<210> 76
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> DPB1 locus-specific primer; allelic location: nt
6116-6136 of DPB1 4.1; designation: DPB E1

<400> 76
tgaggttaat aaactggaga a 21

<210> 77
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> DPB1 locus-specific primer; allelic location: nt
7604-7624 of DPB1 4.1; designation: DPB 5'IVS1

<400> 77
gagagtggcg cctccgctca t 21

<210> 78
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> DPB1 locus-specific primer; allelic location: nt
7910-7929 of DPB1 4.1; designation: DPB 3'IVS2

<400> 78
gagtgagggc tttgggccgg 20